Improving Horse-Handler Communication Using Concepts of Learning Psychology:

Application to Ground Handling of Horses and Training Under Saddle

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Horses were domesticated approximately 6,000 years ago. Horses have been a crucial part of human society and are used for work, recreation, sport, and therapy. Positive interactions between humans and horses require a certain degree of communication. Unfortunately, the high incidences of human related injuries and inadequate horses due to behavioral problems suggest there are deficiencies in the communication between horses and their handlers/riders. Practical experience tells us that horses often exhibit unexpected and defensive behavior without a plausible explanation. It is believed that to solve this problem, the human needs to become the leader in the mind of the horse. The leadership theory has major ethological flaws and essentially uses common elements of many other training techniques. These elements are present even without apparent use of coercion. For example, during application of the round pen technique, there is the possibility that unwanted horse behaviors are simply due to faulty communicative signals performed by the human. Humans are often unaware they are giving such signals to the horse.

The goal of training is to lead the animal to perform a predictable behavior as a result of the appearance of specific signals. Training refers to the acquisition (**learning**) of skills, or competencies as a result of teaching. A successful training program takes into consideration the learning ability of the horse, as this factor will dictate how training will be organized as well as which exercises will be used to obtain the desired behavior or performance.

Horses demonstrate three types of learning: non-associative, associative and cognitive.

<u>**Non-Associative Learning**</u>

The non-associative learning occurs when an animal changes its behavior as a result of repeated exposure to a single stimulus, so that it becomes fixed in the animal's memory. Non-associative learning can be divided into habituation (reduced behavioral response) or sensitization (increased behavioral response) to repeated exposure of a novel stimulus. Habituation is a simple form of learning used to save energy by not reacting continuously to non-threatening and non-rewarding

stimuli. Habituation uses the regular repetition of a stimulus to distinguish what is safe and what is dangerous in the environment and requires that the animal be exposed to a constant and identical stimulus several times before it is classified as harmless. The opposite phenomenon is called "sensitization," in which the progressive amplification of a response follows the repeated administrations of a stimulus that is classified as dangerous. It is a mechanism of learning aimed at increasing the advantageous answers. Often these two forms of non-associative learning are elicited by the same stimulus, but occur at different times. The reactivity of the animal usually increases with the first presentations of the stimulus, and only then decreases. In horses, a common response to unfamiliar situations is to put distance between themselves and potential dangers or use other fight or flight behaviors. With repeated exposure, horses habituate to their surroundings and stop avoiding nonthreatening stimuli. For example, a young horse may spook when touched by a saddle pad or splint boots, but the reaction will diminish with repeated exposure. In order to effectively train a horse with habituation, the stimulus offered must be equal and constant throughout the process. If the stimulus changes shape, intensity, or presentation modality, the horse will react as in the presence of a new stimulus and the process of habituation will be invalidated. Furthermore if the horse learns that a specific behavior can control the stimulus, the use of desensitization exercises to solve a problem will never work because now we are in a different learning pattern; associative learning.

Associative Learning

Associative learning requires that the animal changes its behavior after it has learned the relationship between two events, where the first event is a behavior or an environmental stimulus, and the second event is reinforcement.

There are two forms of associative learning. Classical Conditioning is a process of behavior modification by which an animal comes to respond in a desired manner to a previously neutral stimulus that has been repeatedly presented along with an unconditioned stimulus that elicits the desired response (e.g. Pavlov's dog salivating in response to the sound of the bell). Operant Conditioning involves the modification of "voluntary behavior" through the use of consequences. Therefore, classical conditioning increases the predictability of environmental stimuli, while operant conditioning allows the animal to associate two events over which it has control.

Operant conditioning is responsible for the majority of the learning that is used in training. Learning occurs by changing the behavior of the animal, following the administration of the reinforcement that increases the probability of a behavior, or the punisher, that decreases the probability of the emission of a behavior. Reinforcement and punishment both use pressure and the release of pressure to communicate with the horse, but obtain complete opposite behavioral responses from the horse, thus indicating how thin the line is between proper communication and sending contradictory signals due to mistakes in timing.

Communicating with the horse through pressure

The actions performed by humans with the hands on the reins, legs and body position on the saddle, halter when lead from the ground or during handling for medication or clinical investigations are mechanical actions. These mechanical actions are transmitted to the horse's body and become "pressures," causing changes in the horse's behavior. The pressures are then removed when the horse performs the desired behavior or stops the undesired behavior. It is the instant in which the pressure is released that results in the horse learning what we want and not the moment in which the pressure starts. This communication is actually a binary language of "*Yes, this is what I want*" (release of pressure) and "*No, this is not what I want*" (application of pressure). Therefore, during training, horses learn that pressure applied by the rider through the reins disappears when they stop or slow their gait, the pressure of the rider's legs disappears when they move forward, and so on. When this does not happen, and the release of pressure is not performed correctly, horses may not understand what is requested of them. At this point, the horse may attempt to stop the discomfort by exhibiting a fight or flight behavior, for example the buck or the rear, behavior that most likely will stop from our end the administration of the pressure for an instant. In that moment we told the horse "*Yes, this is what I want*" repeat the buck.

Another example are horses that shake their head, move and try to rear up during clipping. In this case it is non-associative learning (habituation) and operant conditioning that regulate the behavioral response. Through habituation, in most cases horses learn that the use of the clippers on the body is not an unpleasant stimulus. For this to happen, it is important that the horse stands still while clipping. But if it shakes, moves to the side, or performs other behaviors, and we stop clipping in that moment, the horse will learn that there are behaviors that it can perform to stop

the clipping. In other words, when we start clipping and the horse moves, we should continue the clipping without interruption. When none of the horse's behaviors cause the clipping to stop, it gets habituated to the clipper and stops reacting. This sequence refers to the application of non-associative learning and works well with horses clipped for the first time, especially when we clip the shoulder and abdomen, because even if the horse moves, generally we are able to maintain contact with its body. Things get complicated when we get closer to the head or legs. While clipping these areas (*stimulus*), the horse is able to get away with a sudden movement (*response*) and stop the action of the clipper (*reinforcement*). If this occurs, even if we try to continue the work of desensitization it will be difficult to solve the problem because, through operant conditioning, the horse has just learned that a behavior can stop the action of the clipper. To prevent this problem it is necessary to release the pressure of the clipper at the proper time. We turn on the clipper and get closer to the horse. As soon as the horse begins to show defensive behaviors, even minor ones, we stop and maintain the position with the clipper switch on. When the horse stands still, we immediately turn off the clipper. This sequence needs to be repeated several times until the horse associates that if he is standing still, the clippers turn off. At this point we can go closer and closer and start clipping, because the horse will try to stop us by offering the behavior stand still. It is important to turn off the clipper often when the horse is still, to reinforce its behavior and clip intermittently, rather than continuously as we would do if we were following the habituation process. However, once the association has taken place and the horse thinks it can control the clipper by standing still, we will simply turn off the clipper every once and a while and the horse will stand still for a longer time while the clipper is running because it has learned that the "stand still" behavior is the only way to stop the clipper. It's important to remember that correct application of the rules of animal learning requires concentration on what the horse is doing and what we are doing. To correctly reinforce a behavior we must intervene in a span of a very few seconds immediately after the horse performed the correct behavior (the closer the reinforcement, i.e. the removal of the pressure, is to the behavior, the greater the possibility of creating the association).

Cognitive Learning

The ability of cognitive learning (learning that is concerned with acquisition of problem-solving abilities and intelligence) has been demonstrated in horses. Unfortunately, most of the

experiments conducted to measure cognitive learning in horses have been unsuccessful or only partially successful and have been performed using a small number of subjects. We do know horses have the ability of latent learning (learning discovered later on: learning that is not apparent when it occurs, but that can be inferred later from improved performance) and are able to produce more complex behavior as they age, which provides evidence that a form of cognitive learning is occurring. However, in training, cognitive learning is not as important as the other two forms of learning described above. We do know that horses recognize themselves individually by sight and voice, and recent work has demonstrated horses can learn to understand the meaning of abstract symbols and to use symbols to communicate with humans.

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http://www.angelotelatin.com/en/home-pkv1/

Behavior Modification Technique

https://www.youtube.com/watch?v=YMwLShHnRYQ&list=UUDsNEdQIITUWTMGmQnzoRjQ